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Kind regards,

Team Nexperia

# DATA SHEET



## **PEMZ1** NPN/PNP general purpose transistors

Product data sheet  
Supersedes data of 2001 Sep 25

2001 Nov 07

# NPN/PNP general purpose transistors

# PEMZ1

### FEATURES

- 300 mW total power dissipation
- Very small 1.6 × 1.2 mm ultra thin package
- Self alignment during soldering due to straight leads
- Replaces two SC-75/SC-89 packaged transistors on same PCB area
- Reduced required PCB area
- Reduced pick and place costs.

### APPLICATIONS

- General purpose switching and amplification
- Complementary MOSFET driver for switch mode power supply
- Complementary driver for audio amplifiers.

### DESCRIPTION

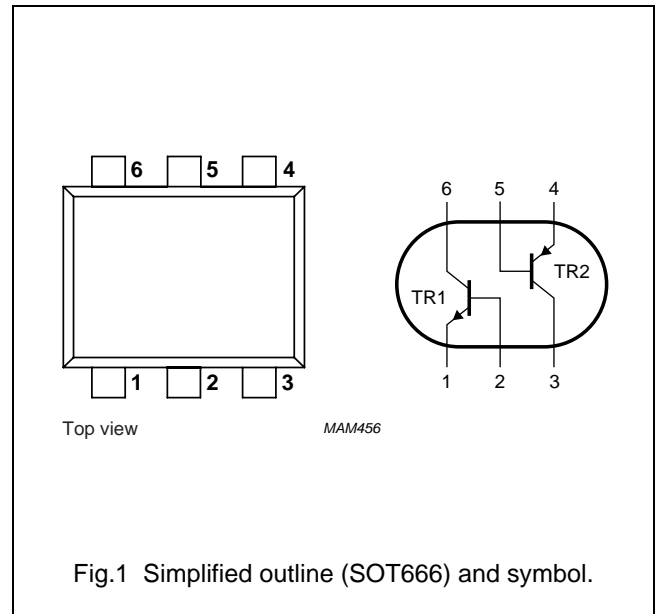
NPN/PNP transistor pair in a SOT666 plastic package.

### MARKING

| TYPE NUMBER | MARKING CODE |
|-------------|--------------|
| PEMZ1       | FZ           |

### PINNING

| PIN  | DESCRIPTION        |
|------|--------------------|
| 1, 4 | emitter TR1; TR2   |
| 2, 5 | base TR1; TR2      |
| 6, 3 | collector TR1; TR2 |



### LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

| SYMBOL   | PARAMETER                     | CONDITIONS                       | MIN. | MAX. | UNIT |
|--|-------------------------------|----------------------------------|------|------|------|
| <b>Per transistor; for the PNP transistor with negative polarity</b> |                               |                                  |      |      |      |
| V <sub>CBO</sub>   | collector-base voltage        | open emitter                     | –    | 50   | V    |
| V <sub>CEO</sub>   | collector-emitter voltage     | open base                        | –    | 40   | V    |
| V <sub>EBO</sub>   | emitter-base voltage          | open collector                   | –    | 5    | V    |
| I <sub>C</sub>   | collector current (DC)        |                                  | –    | 100  | mA   |
| I <sub>CM</sub>  | peak collector current        |                                  | –    | 200  | mA   |
| I <sub>BM</sub>  | peak base current             |                                  | –    | 200  | mA   |
| P <sub>tot</sub>   | total power dissipation       | T <sub>amb</sub> ≤ 25 °C; note 1 | –    | 200  | mW   |
| T <sub>stg</sub>   | storage temperature           |                                  | –65  | +150 | °C   |
| T <sub>j</sub>   | junction temperature          |                                  | –    | 150  | °C   |
| T <sub>amb</sub>   | operating ambient temperature |                                  | –65  | +150 | °C   |
| <b>Per device</b>  |                               |                                  |      |      |      |
| P <sub>tot</sub>   | total power dissipation       | T <sub>amb</sub> ≤ 25 °C; note 1 | –    | 300  | mW   |

### Note

1. Transistor mounted on an FR4 printed-circuit board.

## NPN/PNP general purpose transistors

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## THERMAL CHARACTERISTICS

| SYMBOL        | PARAMETER                                   | CONDITIONS    | VALUE | UNIT |
|---------------|---|---------------|-------|------|
| $R_{th\ j-a}$ | thermal resistance from junction to ambient | notes 1 and 2 | 416   | K/W  |

## Notes

1. Transistor mounted on an FR4 printed-circuit board.
2. The only recommended soldering method is reflow soldering.

## CHARACTERISTICS

$T_{amb} = 25\text{ °C}$ ; unless otherwise specified.

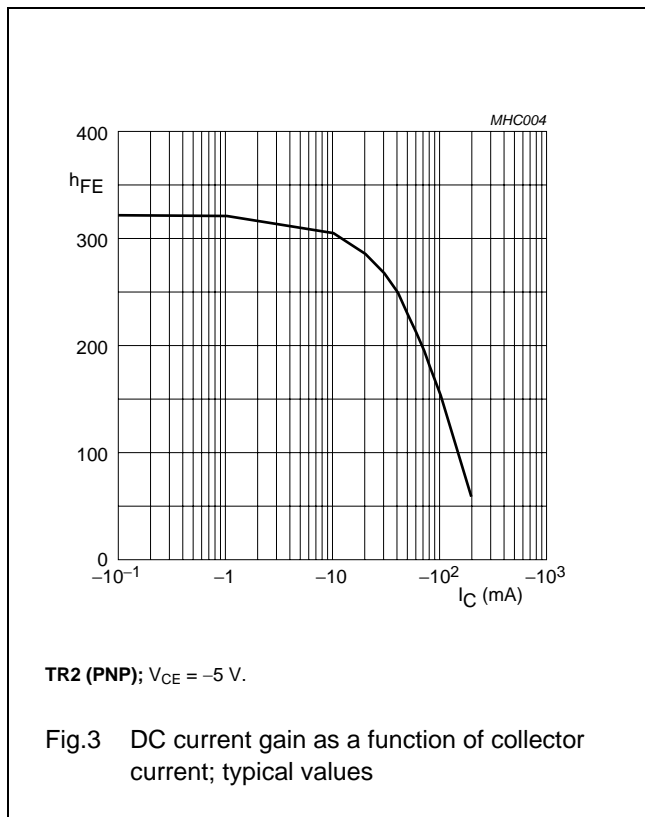
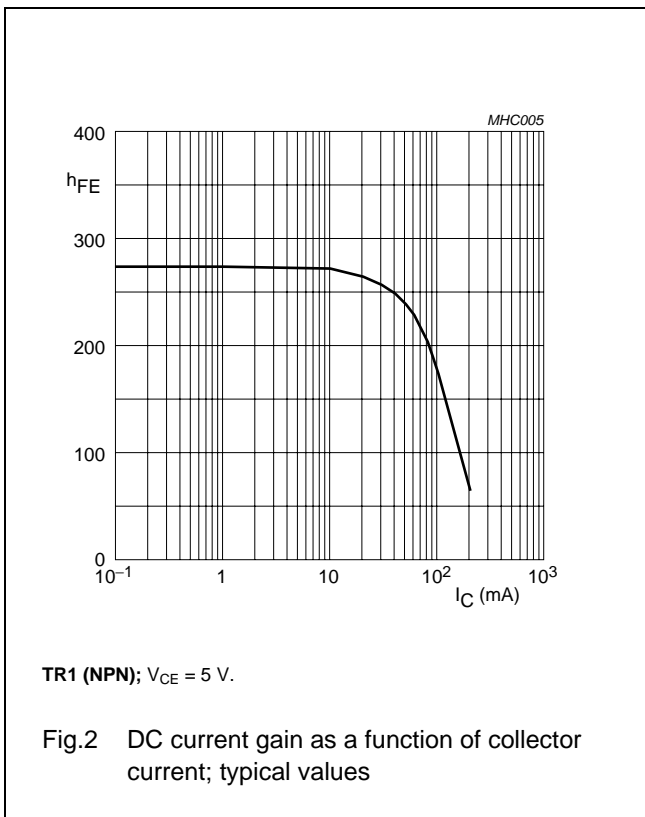
| SYMBOL   | PARAMETER                            | CONDITIONS  | MIN. | TYP. | MAX. | UNIT          |
|--|--------------------------------------|---|------|------|------|---------------|
| <b>Per transistor; for the PNP transistor with negative polarity</b> |                                      |   |      |      |      |               |
| $I_{CBO}$  | collector-base cut-off current       | $V_{CB} = 30\text{ V}; I_E = 0$                               | –    | –    | 100  | nA            |
|  |                                      | $V_{CB} = 30\text{ V}; I_E = 0; T_j = 150\text{ °C}$          | –    | –    | 10   | $\mu\text{A}$ |
| $I_{EBO}$  | emitter-base cut-off current         | $V_{EB} = 4\text{ V}; I_C = 0$                                | –    | –    | 100  | nA            |
| $h_{FE}$   | DC current gain                      | $V_{CE} = 6\text{ V}; I_C = 1\text{ mA}$                      | 120  | –    | –    |               |
| $V_{CEsat}$  | collector-emitter saturation voltage | $I_C = 50\text{ mA}; I_B = 5.0\text{ mA}; \text{note 1}$      | –    | –    | 200  | mV            |
| $f_T$  | transition frequency                 | $I_C = 2\text{ mA}; V_{CE} = 12\text{ V}; f = 100\text{ MHz}$ | 100  | –    | –    | MHz           |
| $C_c$  | collector capacitance                | $I_E = I_e = 0; V_{CB} = 12\text{ V}; f = 1\text{ MHz}$       | –    | –    | –    | –             |
|  | TR1 (NPN)                            |   | –    | –    | 1.5  | pF            |
|  | TR2 (PNP)                            |   | –    | –    | 2.2  | pF            |

## Note

1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

NPN/PNP general purpose transistors

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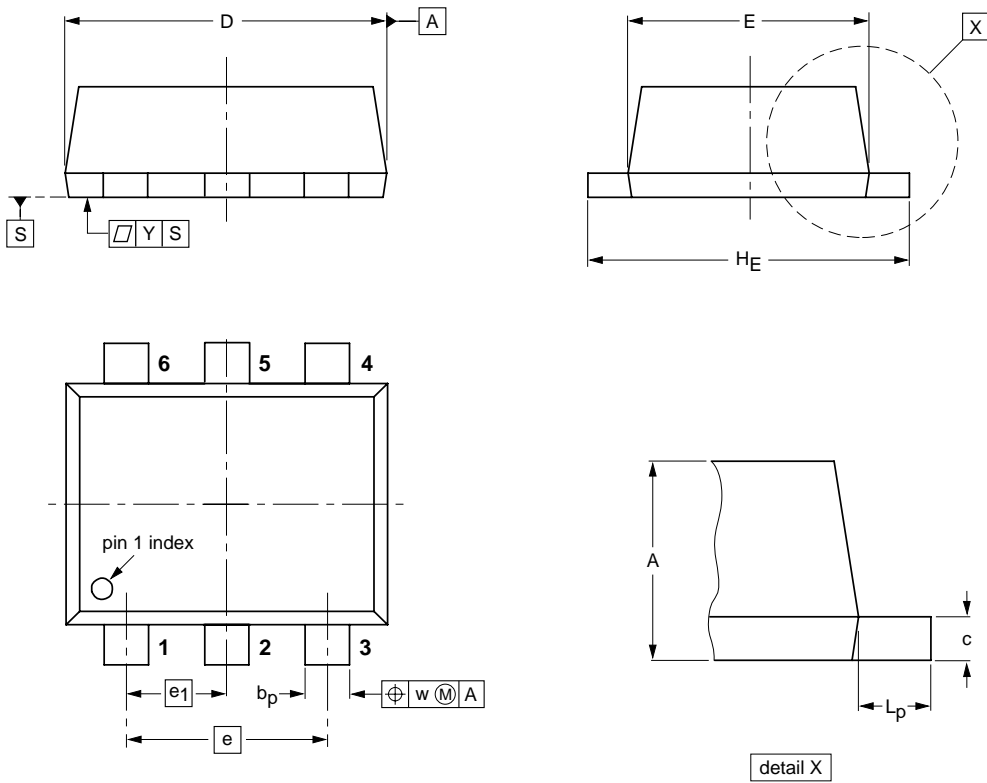
NPN/PNP general purpose transistors

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PACKAGE OUTLINE

Plastic surface mounted package; 6 leads

SOT666



DIMENSIONS (mm are the original dimensions)

| UNIT | A          | $b_p$        | c            | D          | E          | e   | $e_1$ | $H_E$      | $L_p$      | w   | y   |
|------|------------|--------------|--------------|------------|------------|-----|-------|------------|------------|-----|-----|
| mm   | 0.6<br>0.5 | 0.27<br>0.17 | 0.18<br>0.08 | 1.7<br>1.5 | 1.3<br>1.1 | 1.0 | 0.5   | 1.7<br>1.5 | 0.3<br>0.1 | 0.1 | 0.1 |

| OUTLINE VERSION | REFERENCES |       |      |  | EUROPEAN PROJECTION | ISSUE DATE           |
|-----------------|------------|-------|------|--|---------------------|----------------------|
|                 | IEC        | JEDEC | EIAJ |  |                     |                      |
| SOT666          |            |       |      |  |                     | 01-01-04<br>01-08-27 |

# NPN/PNP general purpose transistors

# PEMZ1

## DATA SHEET STATUS

| DOCUMENT STATUS <sup>(1)</sup> | PRODUCT STATUS <sup>(2)</sup> | DEFINITION  |
|--------------------------------|-------------------------------|---|
| Objective data sheet           | Development                   | This document contains data from the objective specification for product development. |
| Preliminary data sheet         | Qualification                 | This document contains data from the preliminary specification.                       |
| Product data sheet             | Production                    | This document contains the product specification.                                     |

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2. The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

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# ***NXP Semiconductors***

## **Customer notification**

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## **Contact information**

For additional information please visit: **<http://www.nxp.com>**

For sales offices addresses send e-mail to: **[salesaddresses@nxp.com](mailto:salesaddresses@nxp.com)**

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